

Course title in English	Acid-base properties of organic compounds and pharmaceuticals
Course title in Polish	Właściwości kwasowo-zasadowe związków organicznych i farmaceutyków
Course code	
Type of course	Lecture
Level of course	PhD
Year of study	1-4
Semester/trimester	2/4/6/8
Number of hours/credits allocated	15/1
Name of lecturer	Beata Liberek
Objective of the course (expected learning outcomes and competences to be acquired)	<p><u>Knowledge:</u></p> <p>Defines basic terms of Brønsted-Lowry, Lewis and Person theories of acidity; associates structure of compound with its acid-base properties; anticipates the way of acid-base reactions in specific medium; associates influence of the acid or base catalysis on the course of selected organic reactions; recognizes the forms of organic compounds and pharmaceuticals with one and more measured pK_a values in solutions with different pH.</p> <p><u>Skills:</u></p> <p>Orders organic compounds in terms of their acid and basic properties; explains the influence of compound's structure on its acidity and basicity; evaluates the possibility of acid-base reactions course; predicts the influence of medium on the acidity of organic compound; discuss a need to use of acid or base catalysis in selected reactions; predicts the forms of organic compounds and pharmaceuticals with one and more measured pK_a values in solutions with different pH.</p> <p><u>Social competence:</u></p>

	Understands the need of a comprehensive view of a problem, discuss different aspects of a problem, keep criticism, appreciate the particular components of the newly gained knowledge.
Prerequisites	Completed classes of General Chemistry and Organic Chemistry within master studies.
Course contents	The influence of organic compound's acidity on the reaction course; Brønsted-Lowry theory; thermodynamic and kinetic acidity constants; Henderson-Hasselbalch equation; the neutralization half point; pK_a and pK_b of H_3O^+ and HO^- ions; acidity constant and state of the acid-base reaction equilibrium; influence of the compound's structure on its acid-base properties: electronegativity, size, hybridization, inductive effect, hyperconjugation, mesomeric effect, aromaticity, steric effects, conformation, hydrogen bonding; organic compounds ordering in terms of their acidity; super acids and super bases; the Hammett acidity function; acidity and medium; solvent leveling effects; the Lewis theory; Pearson's theory; hard and soft acids and basis; influence of the HSAB theory on the reactivity of compounds; neutral, acidic and basic amino acids; estimation of acid-base properties of pharmaceuticals; influence of the pH on the form of pharmaceutical with one and more acidic and/or basic functions; drug distribution versus its acid-base properties.
Recommended reading	M. B. Smith, J. March <i>March's Advanced Organic Chemistry</i> P. Y. Bruice <i>Organic Chemistry</i> D. Cairns <i>Essentials of Pharmaceutical Chemistry</i>
Teaching methods	Multimedia presentation combined with discussion of the problems; individual or group consultations, depending on the needs.
Assessment methods	Achievement of at least 51% of the total number of points from the final test. The percentage result of the test is correlated with the mark in the way indicated in "Study Regulations of University of Gdansk".

Language of instruction	Polish
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